The Occurrence of Hector's Beaked Whale Mesoplodon hectori (Gray) in South African Waters

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Abstract: Two skulls of immature *Mesoplodon hectori* (Gray) found at Lottering River mouth, South Africa (34° 00′ S, 23° 45′ E) are the first records of this species in South African waters. They are the fifth and sixth known specimens of the species.

Generic and specific characters are discussed, together with a review of the species' distribution.

INTRODUCTION

On 12 March 1967 the remains of two small beaked whales, consisting of the skull and broken mandibles and the broken skull and a single rib were found at Lottering River mouth, Cape Province, South Africa latitude 34° 00′ S, longitude 23° 45′ E. Of the soft parts, only the flukes of each and a single flipper remained. The skeletal material was collected for the Port Elizabeth Museum by Mr C. K. Tayler (PEM 1511/15, PEM 1511/16 respectively).

As the apical portions of the mandibles containing the teeth were missing, identification on tooth shape and position was not possible, and the specimens were subsequently identified by Dr Joseph Curtis Moore by means of measurements and photographs provided by the author, as juvenile Hector's beaked whales.

This is the first record of the species for South African waters, bringing the number of *Mesoplodon* species known to South Africa to five. The four species previously recorded are *M. layardi*, *grayi* and *densirostris* (Barnard, 1954) and *M. mirus* (McCann and Talbot, 1963; Ross, 1969).

EXTERNAL FEATURES

Though the one flipper and two flukes found with the specimens were not collected, photographs were taken of each with their respective skulls. As there are apparently no published records of fluke form in *M. hectori*, one photograph has been reproduced (Plate III).

GENERIC CHARACTERS

Since Gray's (1871) description of the type of *M. hectori*, there has been considerable confusion as to the species' taxonomic status, culminating in McCann's (1962) paper, in which he considered *M. hectori* to be the juvenile of *Berardius arnuxi* Duvernoy. Moore (1968) however, in evaluating McCann's argument, has presented evidence that *M. hectori* is in fact a distinct species in the genus *Mesoplodon*. The Lottering Mouth specimens confirm this view in the following points.

Moore states that the asymmetry of the skull of *M. hectori* is as great as that of *M. mirus* and *M. grayi*. The Lottering Mouth specimens conform in this respect in comparison with this museum's three specimens of *mirus* and one *grayi*.

Ness (1967) has measured skull asymmetry in the toothed cetacea in degree of "skew", as the maximum deviation in the "mid-line" suture from the rostral tip to foramen magnum axis in relation to skull length. He published no measurement for *M. hectori*, but (in a letter dated 3 November 1969 to the author) reports figures for one specimen of *hectori* comparable to those he obtained for *M. bidens*, *densirostris*, *europaeus*, *grayi* and *mirus*.

In his generic diagnoses, Moore (1968) listed nine characteristics of the genus *Mesoplodon*. The Lottering Mouth specimens conform on all of the six not restricted to adult specimens.

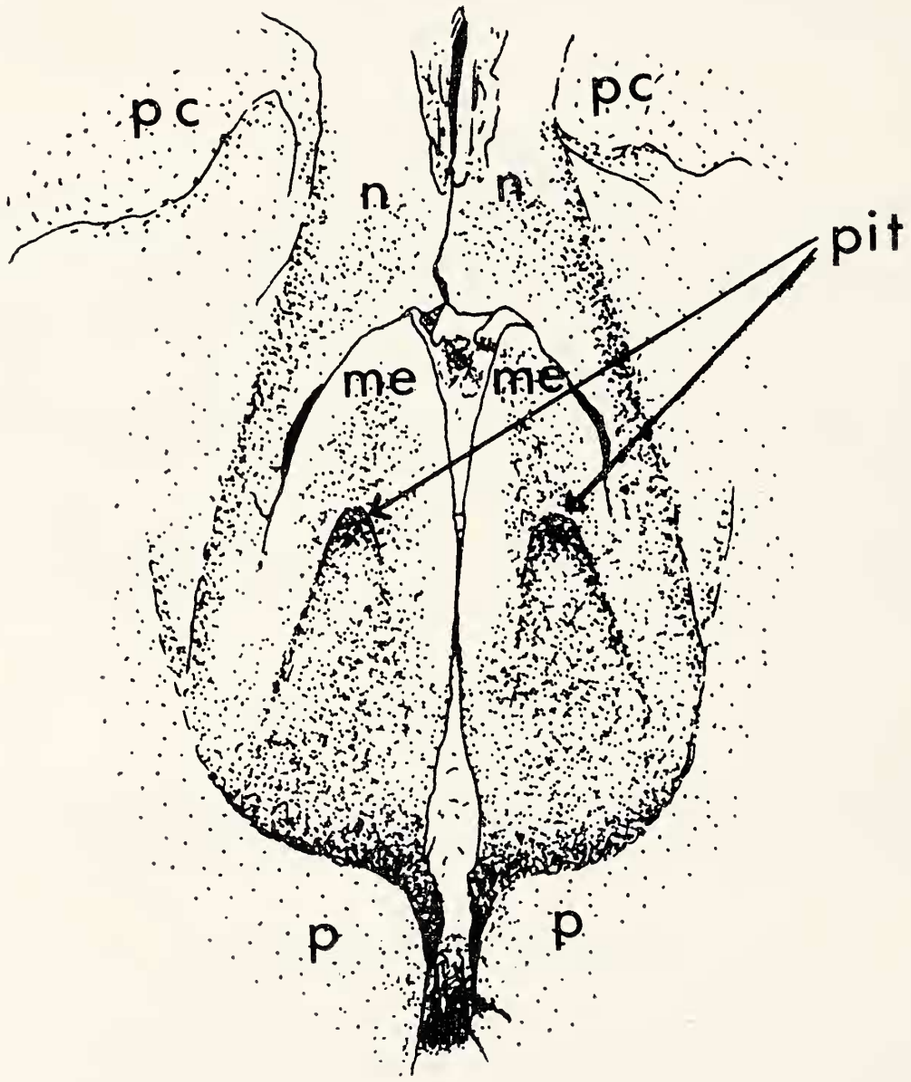

Figure I. The superior nares of *M. hectori* (PEM 1511/15) in antero-dorsal view showing the position of the nasal pits. **me** mesethmoid; **n** nasal; **p** premaxilla; **pc** premaxillary crest; **pit** nasal pit.

SPECIFIC CHARACTERS

In dorsal view, the posterior extremities of the premaxillae are expanded laterally in the Lottering Mouth specimens as much as those of the Falkland Island specimen (Fraser, 1950). The impression of a greater lateral expansion in these two new specimens, however, is due to the narrowness of the vertex posterior to the premaxillary crests (see Plates I and II). In anterior view the greatest width across the crests is equal to, or slightly less than that across the premaxillaries at the level of the anterior border of the superior nares. The three illustrated juveniles (Flower, 1878, pl. 71, fig. 4; Fraser, 1950, pl. 3; McCann, 1962, pl. 2), the Adventure Bay, Tasmania, specimen (Moore, *in litt.*) and the two present specimens conform in this character. This character thus distinguishes all known specimens of *hectori* from the specimens of *M. mirus* (3), *M. grayi* (1), *M. densirostris* (1), and *M. layardi* (1) in this museum, and *M. layardi* (8) in the South African Museum, and from the 4 *M. europaeus* illustrated in Raven (1937), Fraser (1955), Rankin (1956), Moore (1960), the 1 *M. bidens* illustrated by True (1910) and Moore (1966), the 5 *M. stejnegeri* illustrated by True (1910), Nishiwaki (1962) and Moore (1966), the 1 *M. carlhubbsi* illustrated by Moore (1966), the 1 *M. ginkgodens* illustrated by Nishiwaki and Kamiya (1958), and the 2 *M. bowdoini* illustrated by Andrews (1908) and Oliver (1922). Because the six known specimens of *M. hectori* are so distinguished from all of these small samples of the other species, the present author suggests that the relatively narrow width of the premaxillary crest is diagnostic for the species *M. hectori.*

McCann (1962) noted a blind pit on the posterior wall of each narial passage in the New Zealand *M. hectori.* This pit is present in both of the Lottering Mouth specimens (Fig. I). It is situated on the lateral expansion of the mesethmoid bone contributing to the posterior narial wall, and consists of the covered apex of a depression that deepens and narrows dorsally. No function could be assigned to it. Though McCann stated that this pit is absent in other *Mesoplodon* species, a similar, and perhaps homologous structure was found in specimens of *M. densirostris* (1), *M. layardi* (1) and *M. grayi* (1) in this museum. In *M. densirostris* the apex of the pit was directed postero-ventrally and contains a single foramen. In *M. layardi* the apex of the pit was directed posteriorly, while in *M. grayi* the pit was a hemispherical concavity with an indistinct apex. In three specimens of *M. mirus* there was a very shallow groove directed dorso-ventrally in this region. Though no other species were examined, the shape of the pit and the position of its apex in *M. hectori* may yet be shown to be a specific character for this species.

The measurements of the Lottering Mouth specimens shown in Table I, agree fairly closely with those of the two New Zealand specimens (Titahi and Plimmerton) and the Falkland Island skull, and the skull features used by Fraser (1950) are similarly shown by the two present specimens.

The sizes of these five specimens suggest that they are all less than eighteen months of age, a period of rapid growth in cetaceans. With the assumption that sexual and individual variations in measurements are minimal at this age, the differences in total skull length may be used to group the skulls in order of increasing age. On this basis the youngest is the Plimmerton specimen and the oldest the Falkland Island specimen, while the Titahi and the two present specimens are of intermediate age. While the close similarity in measurements (Table I) and the circumstances of the stranding of the present specimens suggest that they are the same age, the Titahi and Plimmerton skulls, though both stranded in January, may well be of different ages, since the time and length of the breeding season is unknown in this species.

If these groupings are correct, then a comparison of measurements 1 and 2 in Table I indicate that an increase in the total length of the skull is primarily an increase in the length of the rostrum. The length of the skull posterior to the rostrum changes relatively little. In addition, measurements 18, 19 and 20 as percentages of total skull length show a decrease

TABLE I.

Skull and mandible measurements of immature *M. hectori* (Gray) (in millimetres)

NO.	P.E.M. 1511/15		P.E.M. 1511/16		TITAHI		PLIMMERTON		FALKLANDS	
	mm	%	mm	%	mm	%*	mm	%*	mm	%*
1	587	100%	278+	—	587+	100%	505	100%	601	100%
2	340	57·9	—	—	343	58·4	280	55·4	358	59·6
3	—	—	—	—	443	75·5	383	75·8	469	78·0
4	—	—	—	—	—	—	—	—	—	—
5	280	47·7	—	—	—	—	—	—	—	—
6	360	61·3	—	—	—	—	—	—	—	—
7	535	91·1	—	—	—	—	—	—	—	—
8	399	67·9	—	—	—	—	—	—	—	—
9	435	74·1	—	—	—	—	—	—	—	—
10	535	91·1	—	—	—	—	—	—	—	—
11	460	78·3	—	—	—	—	—	—	—	—
12	305	51·9	—	—	—	—	—	—	—	—
13	85	14·4	110	—	—	—	84	16·6	—	—
14	91	15·5	93	—	—	—	—	—	—	—
15	42	7·1	37	—	—	—	—	—	—	—
16	±61	10·2	±50	—	—	—	—	—	—	—
17	265	45·1	260	—	—	—	—	—	—	—
18	260	44·2	264	—	258	44·0	238	47·0	242	40·6
19	238	40·2	245	—	228	38·8	207	41·0	228	36·0
20	195	33·2	193	—	—	—	197	40·0	—	—
21	93	15·4	95	—	90	15·3	93	18·4	91	15·2
22	32	3·0	38	—	—	—	—	—	—	—
23	67	11·4	65	—	—	—	59	11·7	—	—
24	39	6·6	43	—	—	—	38	7·5	—	—
25	225	38·3	230	—	—	—	—	—	—	—
26	38	6·4	35	—	—	—	—	—	—	—
27	15	2·5	25	—	—	—	—	—	—	—
28	8	1·4	19	—	—	—	—	—	—	—
29	112	19·0	114	—	—	—	—	—	—	—
30	(109)	18·5	(114)	—	—	—	—	—	—	—
31	112	19·0	118	—	—	—	116	23·0	—	—
32	32	3·0	—	—	—	—	—	—	—	—
33	149	25·3	136	—	—	—	140	27·7	—	—
34	105	17·8	100	—	—	—	—	—	—	—
35	47	8·0	—	—	37	6·3	46	9·1	35	5·7
36	37	6·3	—	—	—	—	37	7·3	—	—
37	48	8·1	50	—	49	8·5	49	9·7	50	8·3
38	67	11·4	68	—	—	—	—	—	—	—
39	±250	42·5	±250	—	235	40·0	252	44·6	240	40·0
40	±55	9·3	±55	—	—	—	—	—	—	—
41	80	13·6	70	—	—	—	—	—	—	—
42	35	5·9	40	—	—	—	—	—	—	—
43	38	6·4	30	—	—	—	—	—	—	—
44	135	22·9	—	—	—	—	—	—	—	—
45	90	—	—	—	—	—	—	—	—	—
46	505	86·0	—	—	481	85·5	440	87·1	498	82·9
47	89+	—	—	—	155	26·4	125	24·8	161	26·8
48	82	13·9	—	—	83	14·1	92	18·2	91	15·2
49	350	59·9	—	—	—	—	—	—	—	—
50	90	—	—	—	—	—	—	—	—	—

*Measurements from McCann (1962).

DESCRIPTIONS OF MEASUREMENTS PROVIDED IN TABLE I (AFTER MOORE, 1963)

1. Greatest length of skull.
2. Greatest length of rostrum, tip of beak to line connecting apices of antorbital notches.
3. Tip of rostrum to posterior margin of pterygoid nearest mid-sagittal plane.
4. Tip of rostrum to most posterior extension of wing of pterygoid.
5. Tip of rostrum to most anterior extension of pterygoid.
6. Tip of rostrum to most posterior extension of maxillaries between the pterygoids on the palate.
7. Tip of rostrum to most posterior extension of maxillary plate.
8. Tip of rostrum to anterior margin of superior nares.
9. Tip of rostrum to most anterior point on premaxillary crest.
10. Tip of rostrum to most posterior extension of temporal fossa.
11. Tip of rostrum to most posterior extension of lateral tip of premaxillary crest.
12. Tip of rostrum to most anterior extension of pterygoid sinus.
13. Greatest length of temporal fossa.
14. Greatest length of orbit.
15. Greatest length of right nasal on vertex of skull.
16. Length of nasal suture.
17. Greatest breadth of skull across post-orbital process of frontals.
18. Greatest breadth of skull across zygomatic processes of squamosals.
19. Greatest breadth of skull across centers of orbits.
20. Least breadth of skull across posterior margins of temporal fossae.
21. Greatest span of occipital condyles.
22. Greatest width of an occipital condyle.
23. Greatest length of an occipital condyle.
24. Greatest breadth of foramen magnum.
25. Greatest breadth of skull across exoccipitals.
26. Greatest breadth of nasals on vertex.
27. Least distance between premaxillary crests.
28. Greatest extension of right premaxillary posterior of right nasal on vertex of skull.
29. Greatest span of premaxillary crests.
30. Least width (strictly transverse) of premaxillae where (and if) they narrow opposite superior nares.
31. Greatest width of premaxillae anterior to place of measurement No. 30.
32. Width of premaxillae at mid-length of rostrum.
33. Width of rostrum in apices of antorbital notches.
34. Width of rostrum in apices of prominential notches (if any).
35. Greatest width of rostrum at mid-length of rostrum.
36. Greatest depth of rostrum at mid-length of rostrum.
37. Greatest transverse width of superior nares.
38. Greatest inside width of inferior nares, at apices of pterygoid notches, on the pterygoids.
39. Height of skull. Distance between vertex of skull and most ventral point on pterygoids.
40. Greatest width of temporal fossa approximately at right angles to greatest length.
41. Least distance between (main or anterior) maxillary foramina.
42. Least distance between premaxillary foramina.
43. Distance from posterior margin of left maxillary foramen to most anterior extension of left maxillary prominence.
44. Greatest length of vomer visible at surface of palate.
45. Amount added to beak because of breakage.
46. Length of mandible (condyle to apex).
47. Greatest length of mandibular symphysis.
48. Greatest depth of mandible.
49. Length from most posterior extension of symphysis to most posterior extension of condyle.
50. Estimated amount added to mandible length because of breakage.

with increasing skull length, indicating that there is little broadening of the skull in proportion to the increase in total length. Measurements 21, 31, 33, 37 and 39 are very similar in all five specimens, suggesting that growth in these dimensions is almost static.

A lateral basirostral groove is absent, the mesorostral canal has not become reduced by increase of the vomer in size within it, and the elements of the occipital region are almost completely fused and coalesced with the basisphenoid. The premaxillary foramina differ in being slightly caudal (PEM 1511/16) or distinctly caudal (PEM 1511/15) to the maxillary foramina, while they are in the same transverse plane in the type and the Falkland Island skull, and rostral in the Tasmanian specimen (Guiler, 1967). This variation strengthens Moore's (1960) findings in *M. gervaisi* that this feature is no longer suitable as a taxonomic character for all species of this genus.

The Lottering Mouth specimens show slight individual differences which may be attri-

buted to individual variation, though it is possible they are sexual differences. It is unlikely however, that these are age differences.

PEM 1511/16 appears more robust than PEM 1511/15 as a result of the anterior extension of the maxillary plate to form the dorsal part of the distinct antorbital tubercle. The jugal forms the antero-mesial, and the lacrimal the antero-ventral surfaces of the tubercle in 1511/16. However, in 1511/15, the lacrimal forms almost the entire tubercle, while the jugal is restricted to the apex of the antorbital notch (Plates I and II). In this latter skull the lacrimal curls around the anterior edge of the frontal, but does not in 1511/16.

GEOGRAPHICAL DISTRIBUTION

Four specimens of *M. hectori* have been recorded previously; two from New Zealand (McCann, 1962), one from the Falkland Island (Fraser, 1950) and one from Tasmania (Guiler, 1967). The present specimens greatly extend the known range of the species, supporting Fraser's suggestion that the species is circumpolar in distribution, and extends the northern limits of its range by some 10° of latitude. While the South African records do not support Guiler's suggestion that the species is rare to the north of 45° S, it is possible that these two are strays from the south, as other sub-antarctic species are not uncommon on the Cape coast, particularly in the first months of the year.

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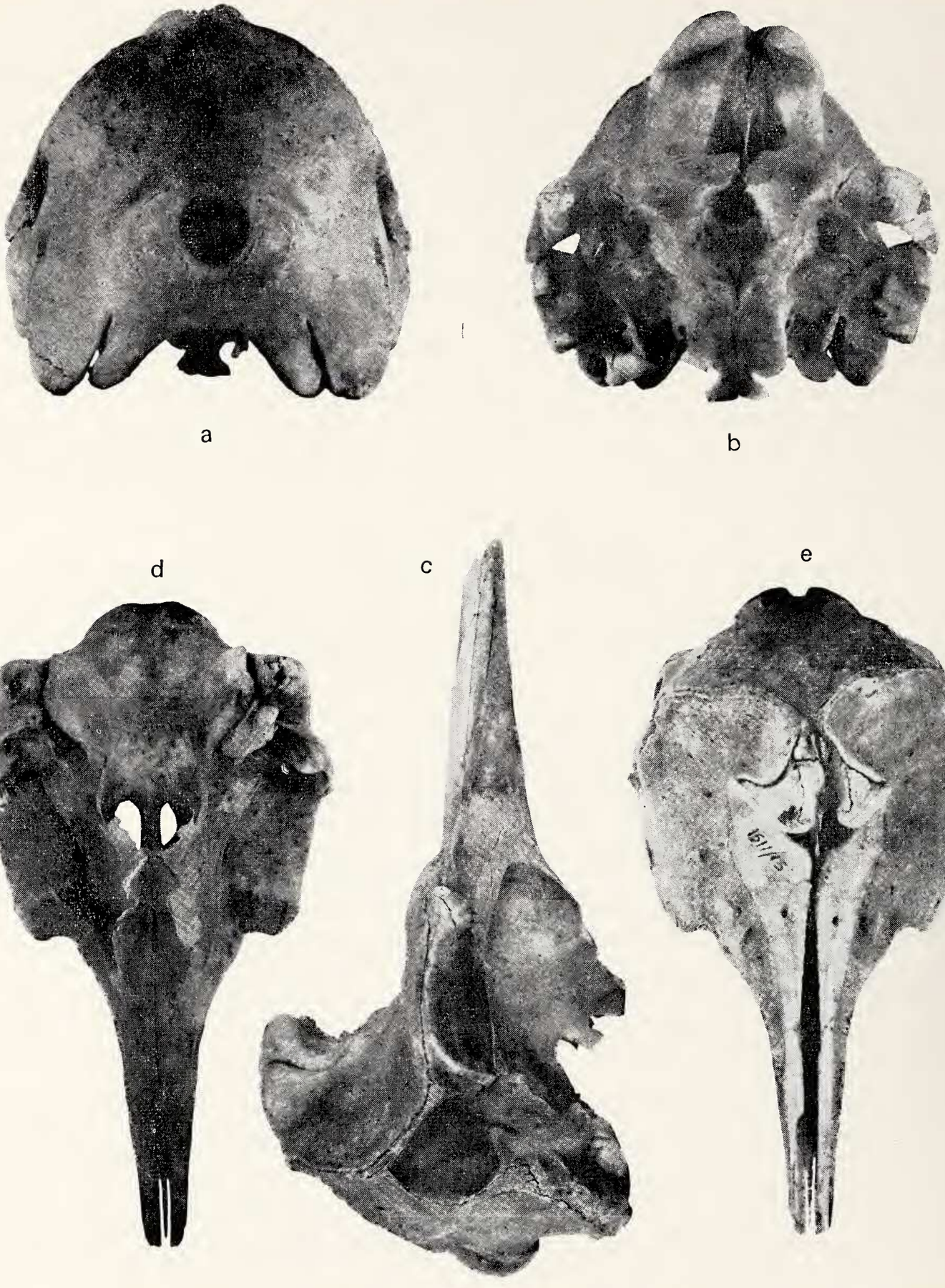

Plate I. Skull of *Mesoplodon hectori* (PEM 1511/15) in (*a*) posterior, (*b*) anterior, (*c*) lateral, (*d*) ventral and (*e*) dorsal views.

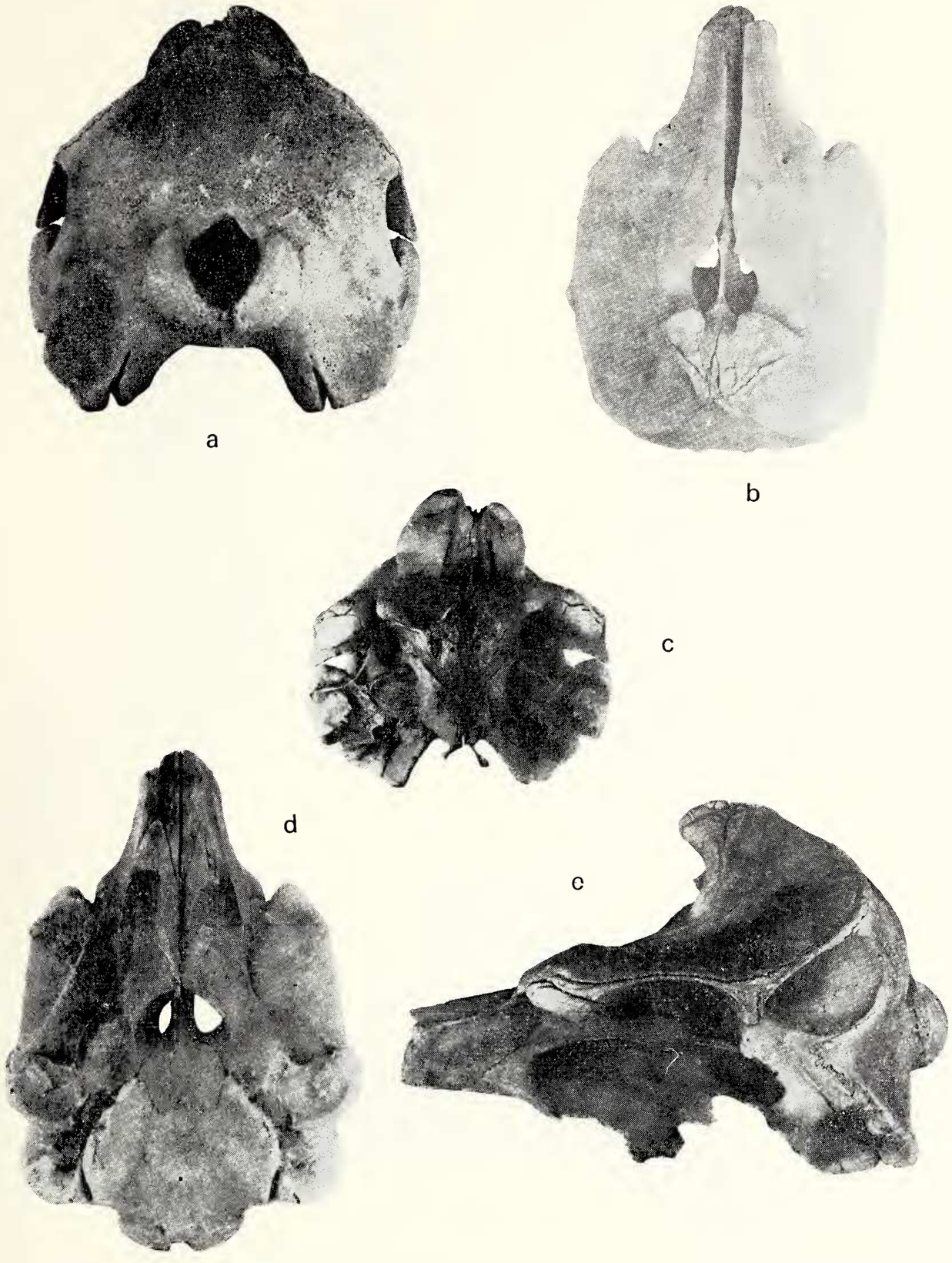

Plate II. Skull of *Mesoplodon hectori* (PEM 1511/16) in (*a*) posterior, (*b*) dorsal, (*c*) anterior, (*d*) ventral and (*e*) lateral views.

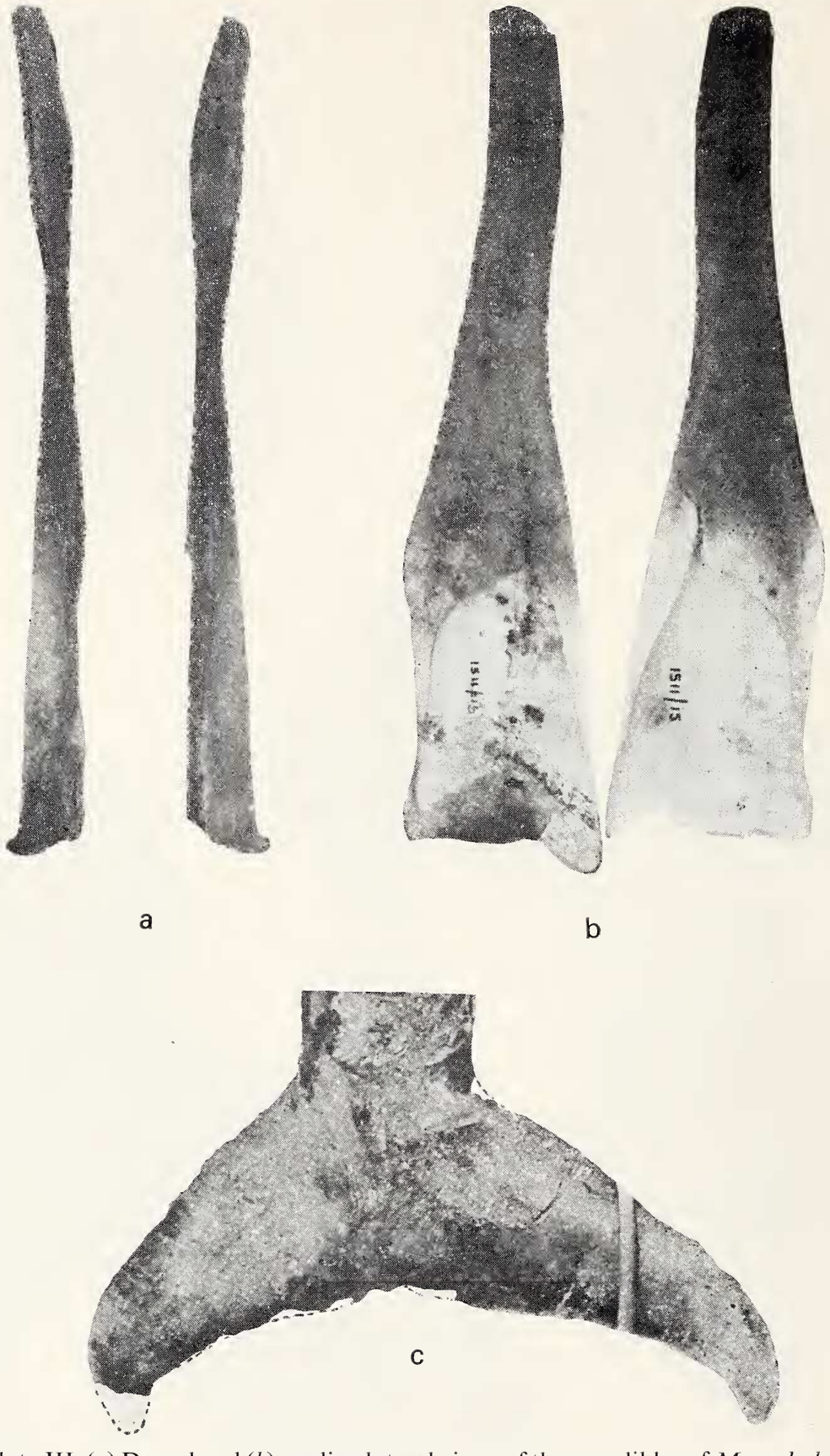

Plate III. (*a*) Dorsal and (*b*) median lateral views of the mandibles of *Mesoplodon hectori* (PEM 1511/15). (*c*) The dried tail-flukes of *M. hectori* (PEM 1511/16).